VYSOKÉ UČENÍ TECHNICKÉ V BRNĚ
BRNO UNIVERSITY OF TECHNOLOGY

FAKULTA STAVEBNÍ
ÚSTAV POZEMNÍHO STAVITELSTVÍ

FACULTY OF CIVIL ENGINEERING
INSTITUTE OF BUILDING STRUCTURES

# FOLDER A – TEXT PART
EVIDENCE PART

# FAMILY RESIDENCE

BAKALÁŘSKÁ PRÁCE
BACHELOR'S THESIS

AUTOR PRÁCE
AUTHOR
DARINA STAŠOVÁ

VEDOUCÍ PRÁCE
SUPERVISOR
Ing. FRANTIŠEK VAJKAY, Ph.D.

BRNO 2014

# VYSOKÉ UČENÍ TECHNICKÉ V BRNĚ
# FAKULTA STAVEBNÍ

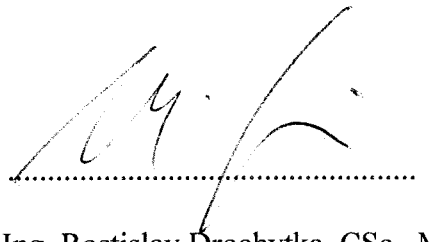
| | |
|---|---|
| **Studijní program** | B3607 Civil Engineering |
| **Typ studijního programu** | Bakalářský studijní program s výukou v anglickém jazyce a prezenční formou studia |
| **Studijní obor** | 3608R001 Pozemní stavby |
| **Pracoviště** | Ústav pozemního stavitelství |

# ZADÁNÍ BAKALÁŘSKÉ PRÁCE

| | |
|---|---|
| **Student** | Darina Stašová |
| **Název** | Family residence |
| **Vedoucí bakalářské práce** | Ing. František Vajkay, Ph.D. |
| **Datum zadání bakalářské práce** | 30. 11. 2013 |
| **Datum odevzdání bakalářské práce** | 30. 5. 2014 |

V Brně dne 30. 11. 2013

prof. Ing. Miloslav Novotný, CSc.
Vedoucí ústavu



prof. Ing. Rostislav Drochytka, CSc., MBA
Děkan Fakulty stavební VUT

**Podklady a literatura**

Studie dispozičního řešení stavby, katalogy a odborná literatura, Zákon č.183/2006 Sb., Zákon č. 350/2012, kterým se mění zákon č. 183/2006 Sb., Vyhláška č.499/2006 Sb.,Vyhl. č. 62/2013, kterou se mění vyhláška č. 499/2006 Sb.,Vyhláška č.268/2009 Sb., Vyhláška č.398/2009 Sb., platné ČSN, Směrnice děkana č. 19/2011 a dodatky.

**Zásady pro vypracování (zadání, cíle práce, požadované výstupy)**

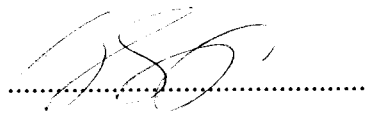
Zadání VŠKP: Projektová dokumentace stavební části k provedení novostavby Family residence.
Cíl práce: vyřešení dispozice pro daný účel, návrh vhodné konstrukční soustavy, nosného systému a vypracování výkresové dokumentace včetně textové části a příloh podle pokynů vedoucího práce. Textová i výkresová část bude zpracována s využitím výpočetní techniky. Výkresy budou opatřeny jednotným popisovým polem a k obhajobě budou předloženy složené do desek z tvrdého papíru potažených černým plátnem s předepsaným popisem se zlatým písmem. Dílčí složky formátu A4 budou opatřeny popisovým polem s uvedením seznamu příloh na vnitřní straně složky.
Požadované výstupy dle uvedené Směrnice:
Textová část VŠKP bude obsahovat kromě ostatních položek také položku h) Úvod (popis námětu na zadání VŠKP), položku i) Vlastní text práce (projektová dokumentace dle vyhlášky č. 499/2006 Sb.) a položku j) Závěr (zhodnocení obsahu VŠKP, soulad se zadáním, změny oproti původní studii).
Příloha textové části VŠKP v případě, že bakalářskou práci tvoří konstruktivní projekt, bude povinná a bude obsahovat výkresy pro provedení stavby (technická situace, základy, půdorysy řešených podlaží, konstrukce zastřešení, svislé řezy, pohledy, detaily, výkresy sestavy dílců popř. výkresy tvaru stropní konstrukce, specifikace, tabulky skladeb konstrukcí – rozsah určí vedoucí práce), zprávu požární bezpečnosti, stavebně fyzikální posouzení stavebních konstrukcí.

**Struktura bakalářské/diplomové práce**

VŠKP vypracujte a rozčleňte podle dále uvedené struktury:

1. Textová část VŠKP zpracovaná podle Směrnice rektora "Úprava, odevzdávání, zveřejňování a uchovávání vysokoškolských kvalifikačních prací" a Směrnice děkana "Úprava, odevzdávání, zveřejňování a uchovávání vysokoškolských kvalifikačních prací na FAST VUT" (povinná součást VŠKP).

2. Přílohy textové části VŠKP zpracované podle Směrnice rektora "Úprava, odevzdávání, zveřejňování a uchovávání vysokoškolských kvalifikačních prací" a Směrnice děkana "Úprava, odevzdávání, zveřejňování a uchovávání vysokoškolských kvalifikačních prací na FAST VUT" (nepovinná součást VŠKP v případě, že přílohy nejsou součástí textové části VŠKP, ale textovou část doplňují).



Ing. František Vajkay, Ph.D.
Vedoucí bakalářské práce

**Annotation**

The bachelor's thesis is aimed on the solution of construction of "Family residence" in form of project documentation. The house is intended for one family. It is located on a slightly sloping parcel 693/12, cadastral area Lhota za Červeným Kostelecem, Červený Kostelec, Královehradecký district. The house is without basement and has two storeys with garage for two cars. The object is masonry building with gable roof with a slope of 38° and a flat roof with a slope of 1 °.

**Key words**

Family house, detached, garage, gabled roof, flat roof, aerated concrete

**Anotace**

Bakalářská práce je zaměřena na konstrukční řešení rodinného domu ve formě prováděcí dokumentace. Rodinný dům je navržen pro jednu rodinu. Objekt je situován na mírně svažité a velmi prostorné parcele č. 693/12, k.ú. Lhota za Červeným Kostelcem, Červený Kostelec, Královeradecký kraj. Dům je navržen jako dvouposchoďový s garáží pro dvě auta. Objekt je zděný z pórobetonových bloků. Nad obytnou částí je navržena sedlová střecha se sklonem 38° a nad prostorem garáže je navržena plochá pochozí střecha se sklonem 1°.

**Key words in Czech language**

Rodinný dům, volně stojící, garáž, sedlová střecha, plochá střecha, pórobeton

**Bibliografická citace VŠKP**

STAŠOVÁ, Darina. *Family house.* Brno, 2014. 40 s., 68 s. příl. Bakalářské práce. Vysoké učení technické v Brně, Fakulta stavební, Ústav pozemního stavitelství. Vedoucí práce Ing. František Vajkay Ph.D.

**Declaration:**

I declare, that I worked out bachelor thesis alone and that I stated all used information sources.

**Prohlášení:**

Prohlašuji, že jsem bakalářskou práci zpracovala samostatně, a že jsem uvedla všechny použité informační zdroje.

V Brně dne 29. 05. 2014
(In Brno, date)

.....
podpis autora (signature)
Darina Stašová

**Thanks:**

I would like to thank my supervisor of bachelor's thesis Ing. František Vajkay, Ph.D. for proper leading and supervision, patience and helpful advices during consultations.

**Poděkování:**

Tímto bych ráda poděkovala panu Ing. Františkovi Vajkayovi, Ph.D. za vstřícné vedení, ochotu, trpělivost a cenné rady během zpracování bakalářské práce.

V Brně dne 29. 05. 2014
(In Brno, date)

.....
podpis autora (signature)
Darina Stašová

# PROHLÁŠENÍ O SHODĚ LISTINNÉ A ELEKTRONICKÉ FORMY VŠKP

Prohlašuji, že elektronická forma odevzdané typ práce je shodná s odevzdanou listinnou formou.

V Brně dne 29. 05. 2014

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titul jméno a příjmení studenta

DARINA STAŠOVÁ

# Content

## Introduction

The bachelor's thesis is aimed on the solution of construction of "Family residence" in form of project documentation. The house is intended for one family. It is located on a slightly sloping parcel 693/12, cadastral area Lhota za Červeným Kostelecem, Červený Kostelec, Královehradecký district. The house is without basement and has two storeys with garage for two cars. The object is masonry building with gable roof with a slope of 38° and a flat roof with a slope of 1°. The family residence is placed on large parcel with beautiful view to the surrounding nature.

## TEXT PART OF THE THESIS

A. Accompanying report
B. Summary technical report
C. Technical report

## VLASTNÍ TEXT PRÁCE

A. Průvodní zpráva
B. Souhrnná technická zpráva
C. Technická zpráva

| | | | |
|---|---|---|---|
| TYPE OF WORK | **BACHELOR'S THESIS** | | VYSOKÉ UČENÍ TECHNICKÉ V BRNĚ<br>FAKULTA STAVEBNÍ<br>ÚSTAV POZEMNÍHO STAVITELSTVÍ |
| AUTHOR | Darina Stašová | | |
| SUPERVISOR | Ing. František Vajkay, Ph.D. | | |
| BUILDER | Pavel Karmášek, Bratří Čapků 24, Červený Kostelec | | |
| ADDRESS | Parcel no. 693/12, cadastral area Lhota za Č.Kostelcem | | |
| NAME OF CONSTRUCTION | **FAMILY RESIDENCE** | FORMAT | 1 A4 |
| BUILD. OBJECT | SO 01 FAMILY RESIDENCE | DATE | 05/2014 |
| PART | A. TEXT PART | DEGREE OF PD | DPS |
| CONTENT: **ACCOMPANYING REPORT** | | SCALE<br>- | NO.DRAWING<br>- |

CONTENT:

# A.1 Identification data

## A.1.1 CONSTRUCTION DATA

**a) Name of project**
Family residence
**b) The construction site (address, number, cadastral, plot parcel numbers)**
Address: Červený Kostelec, Lhota za Červeným Kostelcem, No. 693/12
Cadastral area: Lhota za Červeným Kostelcem
Parcel number: 693/12
**c) The object documentation**
Family residence, Červený Kostelec, Lhota za Červeným Kostelcem, No. 693/12

## A.1.2 DETAILS OF THE APPLICANT / BUILDER

Name and surname: Pavel Karmášek
Place of residence: Bratří Čapků 24, Lhota za Červeným Kostelcem, Červený Kostelec

## A.1.3 THE CONTRACTOR OF DOCUMENTATION

**a) Name, last name, business name, identification number, if assigned, place of business**
Darina Stašová
Náměrka 777, Rtyně v Podkrknoší

**b) The name and surname of the main designers**
**Authorized persons with highlighted field or specialization of authorization**
Darina Stašová

# A.2 LIST OF INPUT DOCUMENTS

- Cadastral map
- Inspection of the construction site
- Radon report

# A.3 DATA ABOUT THE AREA

**a) The extent of the area**
Family house is located on a building plot no. 693/12, cadastral area Lhota za Červeným Kostelcem.
The plot above is owned by the builder.
The plot is located in the buildable area of the village.

**b) Information about the protection of areas under other laws provisions (historical reservation, historical area, specially protected areas, floodplains, etc.)**
Water source protection zone 2.

**c) Data on runoff**

Rain water will be disposed on the builder's property. Runoff rates will remain unchanged after the new building.

**d) Information on agreement with land planning documentation**

The construction is in accordance with the planning documentation. The affected plots are in the cadastral plan designed as a construction area for family houses.

**e) Information on the approval of the zoning decisions or public contract zoning or land use contest**

The construction is in accordance with the planning documentation.

**f) Information regarding compliance with the general requirements for land use**

The proposed construction is in accordance with Regulation No. 269/2009 Coll. amending the Decree No. 501/2006 Coll., On general land use requirements.

**g) Information on compliance with the requirements of the authorities concerned**

The proposed construction is in accordance with the requirements of the relevant authorities. The requirements of the relevant government authorities are incorporated in the documentation.

**h) A list of exemptions and concessional solutions**

Exceptions are not proposed.

**i) List of related and conditional investments**

The building does not cause related and conditional investments.

**j) A list of land and buildings affected by the location**

*Owners of the land are:*

*Plot No. 693/12*, Lhota za Červeným Kostelcem, Červený Kostelec

- Pavel Karmášek, Bratří Čapků 24, Lhota za Červeným Kostelcem

*Plot no. 719/7* - Karmášek Pavel, Bratří Čapků 24, Lhota za Červeným Kostelcem, 54941, Červený Kostelec

*Surrounding parcels:*

*Plot no. 693/1* - Družstvo Natural Spring, třída Karla IV.468/18, Hradec Králové

*Plot no. 693/4* - Kuldová Lidmila, Devět křížů 177, Lhota za Červeným Kostelcem, 54941, Červený Kostelec

*Plot no. 872* - Město Červený Kostelec, náměstí T.G.Masaryka 120, 54941 Červený Kostelec

*Plot no. 1020* (Rtyně v Podrkonoší) - Štěpánková Lenka, T. G. Masaryka 41, 54901 Nové Město nad Metují

# A.4 DATA ABOUT CONSTRUCTION

**a) New construction or change of completed construction**

Project documentation deals with a new family house of one dwelling unit. House is located on plot no. 693/12, cadastral area Lhota za Červeným Kostelcem. The proposed house has one floor with attic. Floor plan of the house is designed in the shape of "L" built-up area 145.95 $m^{2.}$ .The residential part of the house is covered with a gable roof and an adjacent garage has flat roof. The height of ridge above the 1st floor (±0,000) is 7,030 m. Entry to the site is located on the west side of the parcel from a local road no. 872.

**b) The purpose of the construction**

The building will be used as a residential house for 5 person.

**c) Information on the protection of buildings under other legal regulation**

No requirements.

**d) Information on compliance with the technical requirements for the construction and general engineering standards needed to ensure barrier-free use of buildings**

The proposed construction is in accordance with Decree No. 268/2009 Coll., On technical requirements for buildings. Approach to family house is designed along the paved surfaces of adjacent road no. 872.

**Transport to the** plot no. 693/12 – Lhota za Červeným Kostelcem is ensure from local road no. 872 with exit. Exit is solved by the construction of paved areas on plot no. 639/12 Lhota za Červeným Kostelcem. Exit from communications modified to prevent run-off of surface water downhill the road. The surface water will be sloped to the gutter. In place of the entrance will be automatic sliding gate.

**e) Information on compliance with the requirements of the authorities concerned and the requirements arising from other legislation**

The proposed construction is in accordance with the requirements of the authorities concerned. The requirements of the authorities concerned are incorporated in the documentation.

**f) A list of exemptions and concessional solutions**

Exceptions are not proposed.

**g) The proposed capacity of building**

**Capacities:**

| | |
|---|---|
| Built-up area | 145,95 $m^2$ |
| Enclosed space | 727,50 $m^3$ |
| 1st floor Floor area (including garage) | 111,70 $m^2$ |
| Floor space and attic | 54,05 $m^2$ |
| Total floor area | 165,75 $m^2$ |

Number of users 5

## h) Basic balance of the building

**Electrical power**

Is provided from the new underground cable of low voltage. Underground cable of low voltage runs on parcel no. 716/9 and public road no.872 to the edge of parcel no. 639/12 and it is ended in pillar with insurance and the electric-distributor.

The electric meter (distributor) will be conducted underground cable of low voltage (measured distribution) about length 23,0m to the family house parcel no. 693/12, cadastral Lhota za Červeným Kostelcem, which will be completed in the junction box in technical room. Depth coverage of underground cables is 0.7 m. Expected supply of electrical energy is about 20 kW.

**Drinking water**

Is provided from the pubic water supply system. Water supply connection is connected to the existing water supply system on communication no. 872 and goes to the edge of parcel no. 639/12. The connection of water supply is ended by hydrometer system in technical room. The length of connection of water supply has length about 24,0m.

Estimated consumption of water in the house is 600 l / day. Depth of the water supply connection is 1,2 m below ground level.

**Sewerage**

Sewerage will be made by connection to the public municipal sewerage system. Municipal sewage is stored in the local communication no. 872, cadastral Lhota za Červeným Kostelcem. The new sewer connection is conducted from the family house on the parcel no. 639/12 in length 24,0 m. Sewerage will be stored in depth of 0,8 m below the ground level.

**Rainwater**

Drainage of rainwater is around the building under sidewalk. Rain water from roof areas is collected into gutters and drainpipes directly into sewerage.

**Natural gas**

Natural gas is not used. There is no connection of the gas supply.

**Waste and emissions**

House will have a minimum a negative impact on the environment.
Sewerage is proposed with sewer connection to the public sewerage system, which is fed to the wastewater treatment plant. Production of waste water in the building will be maintained at its current level about 600 l / day. Rainwater from roofs and paved areas shall be disposed off in the dual sewerage. Municipal waste will be sorted by type (paper, plastics, glass and beverage cartons) and stored in containers according to type of waste. The remaining waste will be disposed of in the garbage contract and weighed at the dump.

Heating a house with a central hot water boiler for solid fuel. DHW will ensure power storage water heater.

The construction will be build up according to the traditional way and with no pollution of the environment. Used materials are non-toxic with certificates. In the case of contamination during transport communications will ensure their immediate purge. Surroundings of the building will not be burdened by noise. During the construction will not have any harmful waste. Waste from completed house will be forwarded only to legal or natural person authorized to do business, which operates the facility for recovery or disposal or the collection or to purchase a specified type of waste, or the person who operates the device according to § 14 paragraph 2 the Waste Act.

During the execution of the construction of a house and during its operation does not leak substances adversely affecting the quality and safety of groundwater and surface water. Substances affecting the quality and safety of water for the whole building object stored so as to prevent their release into surface and ground water during floods.

**i) Accruals related to building links and making the building and other measures affected territory**

The building will be build-up independently. The start of construction is not subject to further another building. During storage underground networks is necessary to keep the smallest permissible horizontal distance of the overlapping networks of underground and leave the smallest vertical distance at the crossing of underground networks according to CSN 73 6005$^{th}$. Before the construction is necessary to carry out demarcation of existing networks in the area of construction .

**j) Estimated period of construction, including a description of the construction process**

Expected date of start of construction is 1$^{th}$ June 2014.
Construction will be contracted out. The construction will be carried out as normal.
Before start of construction will be taken out the overburden of cultural layer of soil. After laying of individual connections starts the construction of the house.

Expected date of completion is November 2015.

**k) Estimated cost of construction**

The estimated cost of construction is 3 900 000, - CZK

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| ADDRESS | Parcel no. 693/12, cadastral area Lhota za Č.Kostelcem | | |
| NAME OF CONSTRUCTION | **FAMILY RESIDENCE** | FORMAT | 1 A4 |
| BUILD. OBJECT | SO 01 FAMILY RESIDENCE | DATE | 05/2014 |
| PART | A. TEXT PART | DEGREE OF PD | DPS |
| CONTENT: **TECHNICAL REPORT** | | SCALE<br>- | NO.DRAWING<br>- |

CONTENT:

# B.1 DESCRIPTION OF THE BUILDING

**a) Characteristics of building land**

Building land is located in the quite area of the town Červený Kostelec. At the western side of the property runs a local road no. 872.

**b) A list of the conclusions of completed surveys and analyzes (Geological Survey, Hydrogeological survey, construction and historical research, etc.)**

She inspected the building and the status was taken into account in the design documents.

**c) The existing protection and safety zones**

Water source protection zone 2.

**d) Position relative to flood territory undermined areas, etc.**

The building is on land that is not in the flood area. The bedrock at the site of construction is stable and can't cause landslides. The construction site is not present on undermined territory. The building is not located in a seismically active area.

**e) The impact of construction on the surrounding buildings and land, protection of environment, the impact of runoff conditions in the territory**

The building will not have a negative impact on surrounding land. Rain water will be retained into sewerage.

**f) Requirements for decontamination, demolition, tree felling**

No requirements.

**g) Requirements for the maximum occupation of agricultural land or land intended to fulfill the function of forests (temporary / permanent)**

No requirements.

**h) Technical conditions for connection to the existing infrastructure**

All infrastructures connections are possible to connect to the existing public infrastructure.

**i) Time link of building, conditioning, developed, related investments**

Expected date to start with the construction is June 2014.

The start of construction is not subject to further construction of another, or does not cause other related investments.

Before construction is necessary to carry out demarcation of existing networks in the area of construction.

## B.2 The description of the building

## B.2.1 Purpose of building use

**a) The function of the building**

In the family house is located one dwelling unit designed for permanent housing.

**b) The basic functional unit capacity:**

| **Capacities** | |
|---|---|
| Built-up area | 145,95 $m^2$ |
| Enclosed space | 727,50 $m^3$ |
| 1st floor Floor area (including garage) | 111,70 $m^2$ |
| Floor space and attic | 54,05 $m^2$ |
| Total floor area | 165,75 $m^2$ |
| | |
| Number of users | 5 |

**c) The maximum amount produced and the types of waste and emissions and the treatment**

Sewerage of the house is designed by sewer connection to the existing sewerage systems. Production of waste water in the building will be maintained at its current level about 600 l / day.

Rainwater from roofs and paved areas will be also connected to sewer connection.

Municipal waste will be sorted by type (paper, plastics, glass and beverage cartons) and stored in containers according to type of waste. The remaining waste will be disposed of in the garbage contract and weighed at the dump.

Heating by wood boiler. Drinking hot water will be ensured by power storage water tank. Additionally the house is heated by fireplace in living room in first floor.

The construction will be done by traditional way and not cause pollution of the environment. Used materials are non-toxic with certificates. In the case of contamination during the construction will be immediately purge. Surrounding of the building will not be excessively burdened by noise. During the construction will not have any harmful waste.

Waste from completed house will be forwarded only to legal or natural person authorized to do business, which operates the facility for recovery or disposal or the collection or to purchase a specified type of waste, or the person who operates the device according to § 14 paragraph 2 the Waste Act.

During the execution of the construction of a house and during its operation does not leak substances adversely affecting the quality and safety of groundwater and surface water. Substances affecting the quality and safety of water for the whole building object stored so as to prevent their release into surface and ground water during floods.

## B.2.2 Total urban and architectural design

**a) Urbanism - territorial control, spatial composition solution**

The family house will form a detached building completed by low vegetation. The land intended for construction is slightly sloping. The land is used for agriculture. For the building-site equipment will be used part of the land on parcel no.

639/12, cadastral Lhota za Červeným Kostelcem. The land use for building site equipment is owned by the builder. The surrounding land will not be used.

**b) Architectural design - shape of the composition, material and color solutions**

The architectural design is based primarily on field conditions of land designed for construction, the surrounding buildings and the owner.

Main part of the building has a rectangular shape. Over the main part of building is gabled roof and garage is covered by flat roof with assessable terrace. The building has one floor and attic.

Material solution is designed as follows: Part of the facade is made from smooth light gray plaster and the secondary part of building is made from smooth gray plaster. Material of roof cover is made from concrete roof tiles Bramac – red color. The roof is designed with gutters.

Window frames are plastic with double glassing and brown color. Main and side entrance doors are plastic with plastic infill, their color is brown. All tin smiting works will be made of Lindab system. The overall character of the house is in shades of gray with natural brown color for windows and wooden planks.

## B.2.3 Total operating solutions, technology

In the family house is located one dwelling unit.

The main entrance to the living part of building is on the South side.

The entrance to the residential part of the house is in first floor and leads through an entrance hall, which is sized for 5 people.

From the space of entrance hall is access to the bathroom, garage, office room and living room. In the spacious living room is kitchen with panorama window and dining table. Living room is lighted by french windows on the south-west side. Due to the large amount of glazing is the living area perfectly connected with garden. In the middle of living room is fireplace. Kitchen is designed in an "U" shape and dining area is designed for 8 people.

From the space of living room continue double-turn stairs with landing. Under the one side of stairs is used the space for a small storage room.

By the stairs we go directly to the hall of attic floor. From the hall is access to bedroom with balcony, bathroom, toilet and two rooms for children with access to the terrace above the garage.

Pedestrian entry and exit for vehicles on parcel no.639/12 are located on the South side of the parcel from a local road.

Construction of a family residence is designed from air create blocks Porfix. Foundation are designed as foundation strips. Ceiling structure is made from composition of concrete beams and blocks with coverage of concrete with reinforcement. Plastic windows are designed with heat-insulating double glazing. Roof cover is designed from concrete roof tiles Bramac.

## B.2.4 Disable access to the building

The proposed constructions are in accordance with regulation No.268/2009 Coll.

## B.2.5 Safety usage of the building

The building is designed without any unacceptable risks.

## B.2.6 Basic characteristics of objects

**a) Building Solution**

The building is designed as a wall system based on the foundation strips. Ceiling structure is made from composed concrete beams and blocks – system Tresk. The ceiling composed structure Tresk is covered by concrete with reinforcement net to get the structure more stiff and monolithic. The gable roof truss is made from wooden profiles connected by special steel anchoring.

**b) Structural and material solutions**

Foundation strips are designed from plain concrete and upper part from permanent concrete formwork filled by plain concrete (C 16/20). On the top of foundation strip is foundation reinforced slab of 100 mm, reinforced by net of Ø6 with mesh 150/150 mm. Load bearing walls are constructed from air create blocks Porfix 300 mm. Computation strength of masonry is 4 MPa. The ceiling structure is made from concrete beams and blocks of system Tresk covered by concrete C20/25 with reinforcing net.

**c) Mechanical resistance and stability**

The building structure is designed according to static requirements.

## B.2.7 Basic characteristics of technical and technological equipment

**a) The technical solutions**

Not deal with.

**b) List of technical and technological equipment**

Not deal with.

## B.2.8 Fire safety solutions

**a) The distribution of buildings and structures in fire zones**

One fire zone.

**b) Calculation of fire risk and determine the degree of fire safety**

Not deal with in the construction of this range.

**c) Evaluating the design of building structures and building products, including requirements to increase the fire resistance of structures.**

Not deal with in the construction of this range.

**d) Evaluate the evacuation of people, including the evaluation of escape routes**

Not deal with in the construction of this range.

**e) Evaluation safety distances and definition of fire danger zone**

Specified in fire-safety report.

**f) Ensuring the necessary amount of fire water or other extinguishing agents, including deployment of internal and external supply points**

Specified in fire-safety report.

**g) Evaluate the possibility of access roads**

Solved in fire-safety report and fire-safety situation.

**h) Evaluation of the technical and technological equipment**

Not deal with in the construction of this range.

**i) The security requirements of construction fire safety equipment**

Not solved.

**j) The extent and method of placement of warning and safety signs and tables**

Not solved.

## B.2.9 The principles of energy management

**a) Technical criteria for evaluation of thermal properties**

Construction is proposed in accordance with ČSN 73 0540-2 (Thermal protection of buildings –part 2). Windows in the building are designed plastic with double glazing. The thermal transmittance of the window is U = 0.6 W / $m^2$ K. Required by the standard heat transfer coefficient for the window and door of the heated space to the outdoor environment is $U_N$ = 1.7 W / $m^2$ K.

The roof structure will be insulated with mineral wool thickness 260 mm. Thermal insulation shall be protected against water vapor barrier JUTAFOL. The heat transfer coefficient proposed ceiling is U = 0.13 W / $m^2$ K. Required by the standard heat transfer coefficient for the ceiling under unheated space is $U_N$ = 0.15 W / $m^2$ K for passive house.

**b) Assessment of the use of alternative energy sources**

Alternative sources of energy are not proposed.

## B.2.10 Hygienic requirements, work and community environment

Fundamentals of building parameters (ventilation, heating, lighting, water supply, waste etc.) and design principles of the construction impact on the environment (vibration, noise, dust, etc.)

Ventilation

The family house is ventilated naturally by opening windows. All requirements about air exchange are respected (20 $m^3$ / hour for wardrobe space, 30 $m^3$/ h for 1 basin, 150 $m^3$/ h per shower and 50 $m^3$/ h per toilet)

Heating

Heating is designed as a floor heating. As a source of heat is boiler for solid fuel and other source of hot water is electric boiler. Secondary source of heat is fireplace in living room in 1st floor.

Lighting

The family house has to types of lightening. Daily lighting and additional artificial light. Daylight is provided by window openings and artificial lighting will be provided with lights mounted on the ceiling and walls.

Water

Drinking water is provided from a public water supply system.

Waste

Municipal waste will be sorted by type (paper, plastics, glass and beverage cartons) and stored in containers according to type of waste. The remaining waste will be disposed in the garbage contract. During the execution of the construction of a house and during its operation does not leak substances adversely affecting the quality and safety of groundwater and surface water. Substances affecting the quality and safety of water for the whole building object stored as to prevent their release into surface and ground water during floods.

Noise

Occupational noise limits in the protected interior of the buildings and hygienic limits noise in protected outdoor space and buildings in a protected outdoor area will be ensured by regulation No. 272 of 24 August 2011 on the protection of health from the adverse effects of noise and vibration.

## B.2.11 Protection of the structure against the negative environmental effects

**a) Protection against radon from soil**

The building is protected against penetration of medium intensity of radon by radon insulation on the top of foundation desk.

**b) Protection against stray currents**

The building will be equipped with the lightning conductor system according to ČSN EN 62 305 1-4 and regulations 268/2009 Coll.§ 36.

**c) Protection against technical seismicity**

The building is not located in a seismically active area.

**d) Protection against noise**

Occupational noise limits in the protected interior of the buildings and hygienic limits noise in protected outdoor space and buildings in a protected outdoor area will be ensured according the regulation No. 272 of 24 August 2011 on the protection of health from the adverse effects of noise and vibration.

**e) Flood control**

The building is proposed on land without the flood area.

**f) Other effects (effect of undermining, the occurrence of methane, etc.)**

The construction site is not present on undermined territory.

## B.3 Connecting to the technical infrastructure

**a) Connecting locations to the technical infrastructure**

Underground cable of low voltage runs on parcel no. 716/9 and public road no.872 to the edge of parcel no. 639/12 and it is ended in pillar with insurance cabinet and the electric-distributor.

The electric distributor will be conducted underground cable of low voltage (measured distribution) about length 23,0m to the family house parcel no. 693/12, cadastral Lhota za Červeným Kostelcem, which will be completed in the junction box in technical room. Depth coverage of underground cables is 0.7 m. Expected supply of electrical energy is about 20 kW.

Is provided from the pubic water supply system. Water supply connection is connected to the existing water supply system on communication no. 872 and goes to the edge of parcel no. 639/12. The connection of water supply is ended by hydrometer system in technical room. The length of connection of water supply has length about 23,0m.

Estimated consumption of water in the house is 600 l / day. Depth of the water supply connection is 1,2 m below ground level.

Sewerage will be made by connection to the public municipal sewerage system. Municipal sewage is stored in the local communication no. 872, cadastral Lhota za Červeným Kostelcem. The new sewer connection is conducted from the family house on the parcel no. 639/12 in length 24,0 m.

Sewerage will be stored in depth of 0,8 m below the ground level.

## B.4 Traffic Solutions

**a) Description of the transport solution**

House is connected to the supporting infrastructure, transport and n congress of local roads. Local road is connected to the road network.

**b) Connection to the existing transport infrastructure**

Transport to the plot no. 693/12 – Lhota za Červeným Kostelcem is ensure from local road no. 872 with exit. Exit is solved by construction of paved areas on plot no. 639/12 Lhota za Červeným Kostelcem.

**c) Parking**
Before the family house are proposed at least two parking spaces for cars.

**d) Walking and cycling trails**
Near to the house are not walking and biking trails.

## B.5 Solution vegetation and associated landscaping

**a) Landscaping**
There will be minimal change of existing terrain.

**b) Existing vegetation elements**
There is only grass vegetation. No trees and bushes will be removed.

**c) Biotechnical measures**
Biotechnical measures are not proposed.

## B.6 Describe the impact of construction on the environment

**a) The impact on the environment - air, noise, water, waste and soil**
House will have minimal negative impact on the environment.

Sewerage house is proposed sewer connection to the public sewerage system, which is fed to the wastewater treatment plant. Production of waste water in the building will be maintained at its current level and to about 600 l / day.

Rainwater from roofs and paved areas shall be disposed off in the dual sewerage.

Municipal waste will be sorted by type (paper, plastics, glass and beverage cartons) and stored in containers according to type of waste. The remaining waste will be disposed of in the garbage contract and weighed at the dump.

Heating a house with a central hot water boiler for solid fuel. DHW will ensure power storage water heater.

The construction will be build up according to the traditional way and with no pollution of the environment. Used materials are non-toxic with certificates. In the case of contamination during transport communications will ensure their immediate purge. Surroundings of the building will not be burdened by noise. During the construction will not have any harmful waste. Waste from completed house will be forwarded only to legal or natural person authorized to do business, which operates the facility for recovery or disposal or the collection or to purchase a specified type of waste, or the person who operates the device according to § 14 paragraph 2 the Waste Act.

During the execution of the construction of a house and during its operation does not leak substances adversely affecting the quality and safety of groundwater and surface water. Substances affecting the quality and safety of water for the whole building object stored so as to prevent their release into surface and ground water during floods.

**b) The impact on nature and landscape protection (protection of trees, protection of protected trees, protection plants and animals, etc.), maintaining the ecological functions and linkages in the landscape**

The construction will not affect trees, heritage trees, plants and animals.

**c) The influence of the system of protected areas Natura 2000**

Not solved.

**d) The proposal taking into account the circumstances of the conclusion of the proceeding or the EIA**

Not solved.

**e) The proposed protective and safety zones, range limitations and conditions for the protection under other laws**

Water source protection zone 2.

## B.7 Civil Protection

In case of leaving the building follow the general principles to prevent extraordinary and harmful effects.

**Principles for leaving the building:**

Turn off electrical appliances except refrigerators and freezers, in which is stored the food.

Close the main gas and water supply (power off).

Disconnect the antenna of television and radio receivers.

Close the windows.

Secure the house against foreign persons.

## B.8 Requirements for organization

**a) Necessary supply for construction site**

The connection of the building to the water supply will be made by connection to the public water supply.

Electrical power is provided from the existing low voltage cable in the distribution cabinet in the edge of parcel.

**b) Drainage site**

Surrounding of the building will be drained by drains into the retention basins.

**c) Connect the site to existing transport and technical infrastructure**

Transport to the plot no. 693/12 – Lhota za Červeným Kostelcem is ensured from local road no. 872 with paved exit.

**d) The impact of the implementation of the construction of the surrounding buildings and land**

The impact of construction to the surrounding buildings will be minimal.

During execution of the family residence will ensure compliance with the requirements of regulation No. 502/2000 Coll. Noise from construction activities shall not exceed in time from 7.00 to 21.00 am in the protected interior of the building LpAmax = 55 dB (A) and in protected outdoor space structures LAeq, T = 65 dB (A).

**e) Environmental protection and site requirements**

Neighboring land around the site will not be affected.

**f) The maximum occupation for the site (temporary / permanent)**

The construction site will be placed on the parcel no. 639/12 owned by the builder.

**g) Types of waste and emissions during construction**

The resulting waste will be separated an putted to special containers in accordance with relevant regulations.

During the construction work is expected following waste:

- *Paper materials* - Paper waste is will be separate to the special container. Can´t be burned on construction site.
- *Steel Elements* - After removing other materials will be offered for purchase as a secondary raw material.
- *Glass* - Glass will be sorted out as a secondary raw material.
- *Plastic packaging* - will be putted to special container. Can't be burned on site.
- *Paints, thinners and adhesives* - will be stored in leak-proof metal containers whose location

**h) The balance of earthworks, supply requirements repository or earth**

Earthwork is balanced.

**i) Protection of the environment during construction**

All the materials have the certificates of quality. During the construction must be minimize dust and noise in the neighborhood of the building. The construction will be done traditionally and there is no pollution of the environment. Waste from the construction site will be taken to a special containers.

Occupational noise limits in the interior area of the building and hygienic limits of noise in protected outdoor space has to satisfy regulation No. 272 of 24 August 2011 on the protection of health from the adverse effects of noise and vibration.

**j) The safety and health at the construction site**

During the construction work is necessary to follow regulations and laws regarding safety at the construction site.

Regulations according to Act No. 309/2006 Coll., Stipulating further requirements for safety and health at work in labor relations, and to ensure the safety and health activities or services outside labor relations (Act on other conditions of safety and health at work), and its implementing regulations, respectively. Government Regulation No. 591/2006 Coll. the specific minimum requirements for health and safety at work on construction sites.

The owner can use the building after all provision tests will be done with satisfied result.

**k) Modifications for barrier-free use of buildings**

Not solved.

**l) Conditions for transport to the site**

Connection of the construction site to the public road no.872 is solved by paved area on the parcel no. 639/12. Any other parcels are not used.

**m) Special conditions for constructing of the building**

Not solved.

**n) Terms**

Proposed term to start construction is June 2014.
Proximate term of completion of construction is November 2014.
Building approval will be done as a one unit in the end of construction works.

| | | | |
|---|---|---|---|
| TYPE OF WORK | **BACHELOR'S THESIS** | | VYSOKÉ UČENÍ TECHNICKÉ V BRNĚ<br>FAKULTA STAVEBNÍ<br>ÚSTAV POZEMNÍHO STAVITELSTVÍ |
| AUTHOR | Darina Stašová | | |
| SUPERVISOR | Ing. František Vajkay, Ph.D. | | |
| BUILDER | Pavel Karmášek, Bratří Čapků 24, Červený Kostelec | | |
| ADDRESS | Parcel no. 693/12, cadastral area Lhota za Č.Kostelcem | | |
| NAME OF CONSTRUCTION | **FAMILY RESIDENCE** | FORMAT | 1 A4 |
| BUILD. OBJECT | SO 01 FAMILY RESIDENCE | DATE | 05/2014 |
| PART | A. TEXT PART | DEGREE OF PD | DPS |
| CONTENT: **TECHNICAL REPORT** | | SCALE<br>- | NO.DRAWING<br>- |

**CONTENT:**

a) the purpose of the object

b ) the principles of architectural , functional,…

c ) capacity , utility area , enclosed space , built-up areas , orientation, and insolation

d ) technical and design of the building

e ) thermal properties of building structures and apertures

f ) a method based on object with respect to the results of the engineering and hydrogeological survey

g ) the impact of the building and its use on the environment and to address any negative effects

h ) transport solution

i) comply with the general requirements for construction

## a) The purpose of the object

Project documentation deals with a new family residance of one dwelling unit. House is located on plot no. 693/12, cadastral area Lhota za Červeným Kostelcem.

The proposed house has one floor with attic. Floor plan of the house is designed in the shape of "L" built-up area 145.95 $m^{2.}$ .The residential part of the house is covered with a gable roof and an adjacent garage has flat roof. The height of ridge above the 1st floor (±0,000) is 7,030 m. Entry to the site is located on the west side of the parcel from a local road no. 872.

## b) the principles of architectural , functional , layout and fine resolutions, and landscaping around the facility, including access solutions

The architectural design is based primarily on field conditions of land designed for construction, the surrounding buildings and the owner.

Main part of the building has a rectangular shape. Over the main part of building is gabled roof and garage is covered by flat roof with assessable terrace. The building has one floor and attic.

In the family house is located one dwelling unit.

The main entrance to the living part of building is on the South side.
The entrance to the residential part of the house is in first floor and leads through an entrance hall, which is sized for 5 people.

From the space of entrance hall is access to the bathroom, garage, office room and living room. In the spacious living room is kitchen with panorama window and dining table. Living room is lighted by french windows on the south-west side. Due to the large amount of glazing is the living area perfectly connected with garden. In the middle of living room is fireplace. Kitchen is designed in an “U” shape and dining area is designed for 8 people.

From the space of living room continue double-turn stairs with landing. Under the one side of stairs is used the space for a small storage room.

By the stairs we go directly to the hall of attic floor. From the hall is access to bedroom with balcony, bathroom, toilet and two rooms for children with access to the terrace above the garage.

Pedestrian entry and exit for vehicles on parcel no.639/12 are located on the South side of the parcel from a local road.

Construction of a family residence is designed from air create blocks Porfix. Foundation are designed as foundation strips. Ceiling structure is made from composition of concrete beams and blocks with coverage of concrete with reinforcement. Plastic windows are designed with heat-insulating double glazing. Roof cover is designed from concrete roof tiles Bramac.

## c) The proposed capacity of building:

| | |
|---|---|
| Built-up area | 145,95 $m^2$ |
| Enclosed space | 727,50 $m^3$ |
| 1st floor Floor area (including garage) | 111,70 $m^2$ |
| Floor space and attic | 54,05 $m^2$ |
| Total floor area | 165,75 $m^2$ |
| Number of users | 5 |

## d) Technical and design solution of the building

**work HSV**

**Excavations**

Earthworks start with removing of topsoil over the area of future building. The thickness of layer is expected around 200 mm. The soil will be stored on the construction site and the investor(builder) will use it for garden creation after finishing of construction.
Excavations works are based on digging of trenches for foundation strips. The depth is given by design into non-freezing zone aproximately 1000 mm.
In the case of groundwater seepage into the trench excavation is necessary to protect the wall by sheeting and drain out the water from it. Installation of connection networks will be carried out and laying of pipelines and cables before construction of foundation.

**Foundation**

Foundation of the building will be carried out on concrete footings width of 500 mm and a height of 800 mm from plain concrete C16/20 plus base concrete desk 100 mm C 20/25. Depth of foundation structures will be carried out to a depth of 1100 mm below the zero level. The base RC slab with reinforcement net KARI with mesh 6 with 150/150 mm. Kari network will be stored at the bottom of the board with minimum cover 30 mm. Concrete slab will form a flat solid base for building. All penetrations through the board as sewer , water connection , electricity connection, a tube for air supply to the fire , will be made as waterproof.
The upper part of foundation strip is from permanent concrete formwork and pouring of concrete C16/20 with a bars that will extend into the base desk.

**Waterproove insulation**

After the foundation structures , including reinforced concrete slabs and technology breaks will be performed waterproof Bitumen layer. The waterproof insulation has to be put on external wall verticaly min. 300 mm under the +0,000m.
Waterproofing will be made in the bathrooms, hall and utility room.

**Vertical structure**

All walls are designed from the system aircreate blocks PORFIX. Eternal loadbearing structure is 300 mm thick with polystyrene insulation EPS th.150 mm. Partitions are made from aircreate blocks PORFIX th.150 mm and 100 mm.
Lintels over doors and windows up to a span of 3500 mm will be from system PORFIX.Large lintels are made from reinforced concrete C20/25.
Masonry in the attic is finished by reinforced concrete wall plate ring. The ring is made of concrete C 20/25 , the longitudinal reinforcement is steel Ø 6 x R12 and R6 tied stirrups Ø 200 mm. The wall plate will be anchored by a threaded rod M20 , which is welded to the reinforcement.

**Thermal and acoustic insulation**

External load bearing wall is insulated by facade polystyrene EPS 70F, th. 150mm. Foundations are insulated by polystyrene EPS GRAY 100, th.100 mm. Floors on the ground are insulated by polystyrene EPS 200 S, th. 140 mm and floors in attic floor is insulated by acoustic insulation EPS 200 S, thickness of 50 and 40 mm. One layer of thermal instulation is from special desks form floor heating.

**Ceiling structure**

Ceiling structure is made from composed concrete beams and blocks – system Tresk. The ceiling composed structure Tresk is covered by concrete with reinforcement net to get the structure more stiff and monolithic.

**Roof truss**

The roof structure is designed as roof truss systém. The rafte is from 120/180 mm and is connected mechanically by M12 with other truss members. The ties beam is 40/160 mm. The center tie beam 140/160 mm is partialy laied on bearing partions and walls Porfix. Wall plates 160x140 mm threaded rods M20 is fixed to pozednickovému wreath.

The roof is gable with 38°. All wooden elements of the truss will be painted with BOCHEMIT against rot and insect damage. The maximum moisture content of wood elements when incorporated into the structure is 15%.

**Staircase**

The staircase is designed as reinfrorced monolitic stairs with cover of wooden steps. The staircase is anchored in basament, eternal wall (middle landing) and ceiling structure.

Stairs railing will be welded from stainless steal to the structure of the staircase from the top.

**Chimney**

Chimney flue will be from the system HELUZ MULTI. Flue pipe will base the design of the chimney on the roof flap through HELUZ HWEB 20 with dimensions 320x320x160 mm. The chimney will walled 650 mm above the ridge of the gable roof and will be completed concrete chimney collar. This same chimneys we have two – one for boiler Verner and on for fireplace.

**work PSV**

**Internal surfaces**

The inner wall surfaces will be form the limecement plaster of thickness 15 mm (external) and 7mm (internal). Coating from dispersion paint colors HET, color white. Plaster edges are made using of plaster edges PROTEKTOR system.

The bathrooms are made of ceramic tiles up to the ceiling. The lining is bonded with adhesive Mapei adesilex P4 products. Under the adhesive in place of splashing water around fixtures will be made waterproof insulation layer.

**External surfaces**

External plaster will consist of adhesive mortar with fiberglass mesh Perlinka with colored plaster silicon grain size of 1.5 mm.
After the core plaster is applied to the tooth surface adhesive mortar with a trowel (width and depth of the teeth 8-12 mm).

**Flooring structure**

Details of the floor compositions are described in drawing C13. Floor construction on the ground needs sufficient thermal insulation to ensure thermal protection of building so that we put there polystyrene EPS 200S, th. 140 mm and for construction of the attic floor we need acoustic insulation EPS 200 S, th.90 mm. In he flooring structure is designed floor heating. All floors structures has to be properly dilatated in the connection of floor and wall or partition by mineral wool strip 10 mm.

**Windows and doors**

Windows, French doors and entrance doors will be made of plastic frames and glass panels of insulating double glazing and heat transfer coefficient U = 0.6 Wm - 2K -1. Plastic is a double-chamber profile with thermal break PU and PE insulation. The joints between windows and walls will be the installation of these panels filled with low-expansion foam. On the exterior side of the window around the opening will be made permeable film ILLBRUCK . On the interior side of the perimeter of the windows will be a vapor barrier reinforced fabric ILLBRUCK .

**Roof cover**

Roofing is designed from concrete roof tiles Bramac. Color be brown.
On the roof surface are designed wooden beams againts sliding of snow and ventilation roof tiles.

**Tinsmithery**

The design of tinsmith structures will be done according to CSN 73 3610 Tinsmithery construction .
All tinsmithing products are designed from the system Lindab minimum sheet thickness . 0.6 mm. External window sills, roof profiles and attic cover. Dimension of each sheet metal components will be specified in the tables of tinsmith products. Anchoring sills will be glued to the base structure.

Stainless balustrade of staircase, terrace and balcony is specified in sheet of tinsmith products and other special dimensions will be measured on construction site.

**Coatings**

Steel structures will be painted with 2 x color synthetic base. Paint wooden outdoor structures will be made thick layer glazing. The penetration of the impregnant used a top coat will form a glaze. The wooden beams will be painted by BOCHEMIT against rot and insect damage.

**Paintings**

Interior plaster will be provided with dispersion paint HET. Color is specify by the builder during the construction.

**Water supply**

Is provided from the pubic water supply system. Water supply connection is connected to the existing water supply system on communication no. 872 and goes to the edge of parcel no. 639/12. The connection of water supply is ended by hydrometer system in technical room. The length of connection of water supply has length about 23,0m. Estimated consumption of water in the house is 600 l / day. Depth of the water supply connection is 1,2 m below ground level.

**Sewerage**

Sewerage will be made by connection to the public municipal sewerage system. Municipal sewage is stored in the local communication no. 872, cadastral Lhota za Červeným Kostelcem. The new sewer connection is conducted from the family house on the parcel no. 639/12 in length 24,0 m.

Sewerage will be stored in depth of 0,8 m below the ground level.

**Storm drainage**

Storm drainage is connected to combined sewerage system.

**Electric supply**

Underground cable of low voltage runs on parcel no. 716/9 and public road no.872 to the edge of parcel no. 639/12 and it is ended in pillar with insurance cabinet and the electric-distributor.

The electric distributor will be conducted underground cable of low voltage (measured distribution) about length 23,0m to the family house parcel no. 693/12, cadastral Lhota za Červeným Kostelcem, which will be completed in the junction box in technical room. Depth coverage of underground cables is 0.7 m. Expected supply of electrical energy is about 20 kW.

**Heating systém**

Heating is designed as a floor heating. As a source of heat is boiler for solid fuel and other source of hot water is electric boiler. Secondary source of heat is fireplace in living room in 1st floor.

The building will be heated by a wood gasification boiler VERNER V140 EXTRA power of 14 kW.

**Ventilation**

All areas of the attic floor of the building will be naturally ventilated by window openings.

## e ) thermal properties of building structures and apertures

The building is designed to meet the CSN 73 0540-2:2011 Thermal protection of buildings - Part 2 : Requirements. See Annex Heat assessment.

## f ) A method based object with respect to the results of geotechnical and hydrogeological survey

Foundation of the building is suitable for the construction of new buildings.

## g ) the impact of the building and its use on the environment and to address any negative effects

House will have minimal negative impact on the environment.

Sewerage house is proposed sewer connection to the public sewerage system, which is fed to the wastewater treatment plant. Production of waste water in the building will be maintained at its current level and to about 600 l / day.

Rainwater from roofs and paved areas shall be disposed off in the dual sewerage.

Municipal waste will be sorted by type (paper, plastics, glass and beverage cartons) and stored in containers according to type of waste. The remaining waste will be disposed of in the garbage contract and weighed at the dump.

Heating a house with a central hot water boiler for solid fuel. DHW will ensure power storage water heater.

The construction will be build up according to the traditional way and with no pollution of the environment. Used materials are non-toxic with certificates. In the case of contamination during transport communications will ensure their immediate purge. Surroundings of the building will not be burdened by noise. During the construction will not have any harmful waste. Waste from completed house will be forwarded only to legal or natural person authorized to do business, which operates the facility for recovery or disposal or the collection or to purchase a specified type of waste, or the person who operates the device according to § 14 paragraph 2 the Waste Act.

During the execution of the construction of a house and during its operation does not leak substances adversely affecting the quality and safety of groundwater and surface water. Substances affecting the quality and safety of water for the whole building object stored so as to prevent their release into surface and ground water during floods.

## h ) transport solution

Transport to the plot no. 693/12 – Lhota za Červeným Kostelcem is ensured from local road no. 872 with paved exit.

## i ) comply with the general requirements for construction

The proposed construction is in accordance with regulation No. 268/2009 Coll., Technical requirements for buildings and regulation No. 269/2009 Coll . Amending regulation No. 501/2006 Coll . , On general land use requirements.

## Conclusion

The project has focused on effective utilization of the large size of the given parcel and on creation of living comfort for future users of the family residents. For the design of the object were used modern  and economic materials enabling connection of esthetical and functional requirements of present times. It has been achieved to integrate the house into the surrounding environment by using a combination of the gable roof and the flat roof.

## Závěr

Projektové řešení rodinného domu bylo zaměřeno na efektivní využití rozsáhlého pozemku a vytvoření požadovaného komfortu pro budoucí uživatele rodinného domu. Pro návrh tohoto domu byly použity moderní a zároveň ekonomické materiály, které splňují estetické i funkční požadavky této doby. Bylo dosaženo propojení rodinného domu s okolním prostředí za pomocí klasické sedlové střechy v kombinaci s plochou pochodí střechou.

**Seznam použitých materiálů a zdrojů / List of used sources**

*Normy( used czech and european standards):*
ČSN 73 4301 – Obytné budovy
ČSN 73 4108 – Šatny, umývárny a záchody
ČSN 73 0833 – PBS – Budovy pro bydlení a ubytování
ČSN 73 0802 – PBS – Nevýrobní objekty
ČSN 73 0540-2 – Tepelná ochrana budov
ČSN 01 3420 – Výkresy pozemních staveb
ČSN 73 0810:06/2005 – Požární bezpečnost staveb – Společná ustanovení
ČSN 73 0802:05/2009 – Požární bezpečnost staveb – Nevýrobní objekty
ČSN 73 0833:10/2010 – Požární bezpečnost staveb – Budovy pro bydlení a ubytování
ČSN 73 0873:06/2003 – Požární bezpečnost staveb – Zásobování požární vodou

*Právní předpisy(used legislation)*
Zákon č. 183/2006 Sb. O územním plánování a stavebním řádů /Stavební zákon/
Vyhláška č. 268/2009 Sb. O technických požadavcích na stavby

*Studijní opory ( study materials)*
Nauka o pozemních stavbách – Modul M01, Ing. Jarmila Klimešová

*Webové stránky: ( web pages of producers and suppliers)*
www.isover.cz
www.wockwool.cz
www.porfix.cz
nahlizenidokn.czuzk.cz
www.dektrade.cz
www.bramac.cz
www.tzb-info.cz
www.knauf.cz
www.rigips.cz
www.fce.vutbr.cz
www.geology.cz
www.pipelife.cz
www.tresk.cz
www.eon.cz

List of used abbreviations and symbols:

| | |
|---|---|
| IGL | Initial ground level |
| FGL | Formational ground level |
| FF | First floor |
| XPS | extruded polystyrene |
| EPS | polystyrene foam |
| U | Overall heat losses coefficient |
| k.ú. | Cadastral |
| DHW | Domestic hot water |
| BPV | Baltic Sea basic level |
| ČSN | Czech national standards |
| Coll. | Collection |

# Attachments

## Folder B – Study

01-02 Ground floor, Attics floor – living areas
03-04 Ground floor, Attics floor
05 Section A-A, B-B
06 Views
07 Visualization

## Folder C1 – Situations

C01 Situation of further relations
C02 Cadastral map
C03 Situation

## Folder C2 – Construction solution

C04 Foundations
C05 Ground plan – first floor
C06 Ground plan - attics
C07 Ceiling structure
C08 Roof truss
C09 Floor plan - roof
C10 Section A-A´
C11 Section B-B´
C12 Views
C13 List of compositions
C14 Detail 01
C15 Detail 02
C16 Detail 03
C17 Detail 04
C18 Detail 05
C19 List of openings
C20 List of tinsmith products

## Folder D – Fire safety

D01 Fire safety report
D02 Situation – fire safety areas

## Folder E – Calculation

E01 Calculation of energy label
E02 Calculation of staircase
E03 Calculation of foundations